

SCOPE OF CLAIMED INVENTION

1. A motor comprising:

a stator including a coil bobbin with winding sections;

5 a terminal section that outwardly protrudes in a radial direction of the coil bobbin; and

a curled case having a partially opened circular cross section, wherein the curled case covers an exterior of the windings of the stator, and the terminal section protrudes through the curled case.

10 2. A motor according to claim 1, wherein the curled case has end sections in the peripheral direction and an opening section defined by the end sections, the terminal section protrudes through the curled case, and the opening section opens at an opening arc angle defined by less than one half of an entire periphery of a circle or less than 180 degrees.

15 3. A motor according to claim 1, wherein the curled case is formed by curling a metal plate along a peripheral direction of the stator.

20 4. A motor according to claim 2, wherein the winding sections of the coil bobbin are disposed adjacent to each other in the axial direction and have at least one metal yolk between the winding sections, and the curled case is welded to an external peripheral section of the yolk, and the opening section opens at an opening arc angle of less than one third of the entire periphery of a circle or less than 120 degrees.

25 5. A motor according to claim 4, wherein the opening angle of the opening section is one sixth of the entire periphery of a circle or 60 degrees or greater.

6. A motor according to claim 1, further comprising a rotor disposed in the stator, and a frame that is affixed to one end face of the stator provided in the axial direction of the stator, wherein the rotor has a rotor shaft that protrudes from one end of the stator and is supported by the frame.

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7. A motor according to claim 6, further comprising a cylindrical sleeve section for passing the rotor shaft provided at an edge of an aperture formed in the stator, wherein the frame has a fixing surface to be affixed to the stator, the fixing surface of the frame having a passing aperture for passing the rotor shaft, wherein the cylindrical sleeve section is inserted in the passing aperture, and the cylindrical sleeve section is formed from a material that has a hardness lower than that of the rotor shaft.

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8. A motor according to claim 1, further comprising a rotor disposed in the stator, and a metal frame that is affixed to one end face of the stator provided in the axial direction of the stator, wherein the rotor has a metal rotor shaft that protrudes from one end of the stator and is supported by the frame.

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9. A motor according to claim 8, wherein the stator has a coil bobbin composed of a resin member and equipped with an aperture section disposed opposite to an external periphery of the rotor, and at least a yolk having pole teeth disposed opposite to the rotor, wherein the yolk is formed with the coil bobbin in one piece by an insert forming method, wherein the metal frame has a passing aperture that is disposed in a manner to overlap the aperture section of the coil bobbin for passing the rotary shaft, the coil bobbin having a cylindrical sleeve section formed integrally with the coil bobbin by a resin member at an edge of the aperture section and being inserted in the passing aperture of the metal frame and,

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10. A motor comprising:

a stator;

a rotor disposed in the stator, the rotor having a rotor shaft that protrudes from at least one end of the stator;

5 a metal frame that supports the rotor shaft and affixed to one end face of the stator provided in the axial direction of the stator, the frame having a fixing surface to be affixed to the stator and a passing aperture in the fixing surface for passing the rotor shaft; and

10 a cylindrical sleeve section for passing the rotor shaft provided at an edge of an aperture in the stator, wherein the cylindrical sleeve section extends in the passing aperture, and the cylindrical sleeve section is formed from a material that has a lower hardness than that of the rotor shaft.

11. A motor according to claim 10, wherein the cylindrical sleeve
15 section has an axial length generally identical with an axial length of the passing aperture in the axial direction.

12. A motor according to claim 10, wherein the cylindrical sleeve
20 section has an axial length greater than an axial length of the passing aperture in the axial direction.

13. A motor according to claim 10, wherein the cylindrical sleeve
25 section has a convex section provided on an external surface thereof to engage a concave section provide in the frame to thereby position the stator with respect to the frame.

14. A motor comprising:

a stator having a coil bobbin composed of a resin member and an aperture section;

a rotor disposed opposite to the aperture section of the stator, the rotor having a metal rotor shaft that protrudes from at least one end of the stator;

a metal frame that supports the rotor shaft and affixed to one end face of the stator provided in the axial direction of the stator, the frame having a
 5 fixing surface to be affixed to the stator and a passing aperture for passing the rotor shaft, the passing aperture being disposed in a manner to overlap the aperture section of the coil bobbin for passing the rotary shaft; and

a yolk having pole teeth disposed opposite to the rotor, the yolk being assembled with the coil bobbin in one piece by an insert forming method,

10 wherein the coil bobbin has a cylindrical sleeve section that is inserted in the passing aperture of the metal frame and formed integrally with the coil bobbin by a resin member at an edge of the aperture section of the stator.

15 15. A motor according to claim 14, wherein the metal frame includes a first plane section that is affixed to one end face of the stator in the axial direction and a second plane section disposed opposite to the first plane section, wherein the rotor shaft protrudes from one side of the aperture section of the stator, passes through the aperture section and a passing aperture that is formed in the first plane section, and is supported by a
 20 bearing provided in the second plane section of the frame.

16. A motor according to claim 14, wherein the cylindrical sleeve section has a measurement in the axial direction that is generally identical or greater than a measurement of the passing aperture in the axial direction.

25 17. A motor according to claim 14, wherein the cylindrical sleeve section has a convex section provided on an external surface thereof such that the convex section serves as a positioning section to be used when the frame is affixed to the stator.